SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

2102-F-21-R-42

Name: Scott Lake **County**: Minnehaha
Legal Description: T102-R51-Sec. 7-8
Location from nearest town: 1 mile north, 2 miles west of Hartford, SD

Dates of present survey: July 14-15, 2009
Dates of the last survey: July 10-11, 2007

Primary Game Species	Other Species
Yellow Perch	Black Crappie
Walleye	Black Bullhead
	Northern Pike
	Green Sunfish
	Orange-spotted Sunfish

PHYSICAL DATA

Surface Area: 107 acres **Watershed**: Unknown acres
Maximum depth: 11 feet **Mean depth**: 4 feet
Lake elevation observed during the survey: Full
Date the latest contour map was prepared: 2001 (shoreline map)
Beneficial use classifications: (6) warmwater marginal fish propagation, (7) immersion recreation, (8) limited-contact recreation and (9) fish and wildlife propagation and stock watering.

Ownership of Lake and Adjacent Lakeshore Properties

Scott Lake is not listed as meandered public water in the State of South Dakota Listing of Meandered Lakes. Most of the lake lies within a Game Production Area (GPA) owned and managed by the South Dakota Department of Game, Fish, and Parks (GFP), however, the land under the very west end of the lake is privately owned

Fishing Access

Scott Lake has no boat ramp although small boats can be launched from shore on the southwest side. A major fishing access improvement project consisting of a new boat ramp, boat dock, floating fishing pier, fishing access trails, shore fishing access points and parking is planned for construction in 2010. Shore fishing is popular along the road right of way on the south side of the lake. The GFP fisheries crew removed steel rebar and cut brush along the road to improve the area for fishing. Ice fishing is popular on the lake.

Field Observations of Water Quality and Aquatic Vegetation

During the survey this year, the water was very clear with a Secchi depth of 74 cm (29 inches). Sago pondweed (*Potamogeton pectinatus*) beds were common throughout the lake, and cattails (*Typha spp*.) were found in shallow areas along the shoreline.

BIOLOGICAL DATA

Methods:

Scott Lake was sampled on July 14-15, 2009 with three overnight gill-net sets and five overnight trap-net sets. The trap nets are constructed with 19-mm-bar-mesh (¾ in) netting, 0.9 m high x 1.5 m wide (3 ft high x 5 ft wide) frames and 18.3 m (60 ft) long leads. The gill nets are 45.7 m long x 1.8 m deep (150 ft long x 6 ft deep) with one 7.6 m (25 ft) panel each of 13, 19, 25, 32, 38 and 51-mm-bar-mesh (½, ¾, 1, 1¼, 1½, and 2 in) monofilament netting. Sampling locations are displayed in Figure 5.

Results and Discussion:

Gill Net Catch

Black bullhead (87.4%), yellow perch (10.7%), and walleye (2.0%) were the only species sampled in the gill nets (Table 1).

Table 1. Total catch from three overnight gill net sets at Scott Lake, Minnehaha County, July 14-15, 2009.

Species	Number	Percent	CPUE[1]	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Black Bullhead	491	87.4	163.7	±28.6	64.6	0	0	90
Yellow Perch	60	10.7	20.0	±10.0	31.4	2	0	106
Walleye	11	2.0	3.7	±0.4	18.1	82	0	92

*3 years (2003, 2005, 2007)

Trap Net Catch

Black bullhead (98.5%) was the most common species sampled in the trap nets this year (Table 2). Other species sampled included yellow perch, walleye, black crappie, orange-spotted sunfish, green sunfish, and northern pike.

[1] See Appendix A for definitions of CPUE, PSD, and mean Wr.

Table 2. Total catch from five overnight trap net sets at Scott Lake, Minnehaha County, July 14-15, 2009.

Species	Number	Percent	CPUE	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Black Bullhead	8,690	98.5	1738.0	±691.9	141.2	0	0	81
Yellow Perch	45	0.5	9.0	±5.5	12.3	11	2	96
Walleye	39	0.4	7.8	±4.1	3.9	95	5	88
Black Crappie	33	0.4	6.6	±1.5	24.4	21	0	114
O. S. Sunfish	11	0.1	2.2	±2.8	27.1	--	--	--
Green Sunfish	3	0.0	0.6	±0.8	2.3	--	--	--
Northern Pike	1	0.0	0.2	±0.3	0.1	--	--	--

*3 years (2003, 2005, 2007)

Walleye

Management objective: Maintain a walleye population with a gill-net CPUE of at least 15.

Gill-net CPUE fell below the management objective in 2009 (Table 3). The population is comprised of larger fish (Figure 1) with a mean length of 399 mm (15.7 in). Scott Lake was stocked with 10,800 small fingerlings in the spring of 2009, followed by 600 large fingerlings in the fall (Table 8).

Table 3. Walleye gill-net CPUE, PSD, RSD-P, and mean Wr for Scott Lake, Minnehaha County, 2000-2009.

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
CPUE				29.0		1.5		23.7		3.7
PSD				77		--		17		82
RSD-P				13		--		1		0
Mean Wr				92		--		91		92

Yellow Perch

Management objective: Maintain a yellow perch population with a gill-net CPUE of at least 25.

Yellow perch gill-net CPUE has increased since 2007 (Table 4) and is approaching the management objective. The sampled perch ranged in length from 13-22 cm (5.0-8.7 in) (Figure 2). Since no perch have been stocked since 2006, the current population is likely the result of successful natural reproduction in 2007 and/or 2008.

Table 4. Yellow perch gill-net CPUE, PSD, RSD-P, and mean Wr for Scott Lake, Minnehaha County, 2000-2009.

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
CPUE				79.3		12.0		2.7		20.0
PSD				25		79		--		2
RSD-P				2		54		--		0
Mean Wr				97		98		--		106

Black Crappie

Management objective Maintain a black crappie population with a trap net CPUE of at least 20.

Black crappie abundance decreased in 2009 (Table 5) and the fish sampled ranged in length from 16-24 cm (6.3-9.4 in) (Figure 3). Crappies are not a primary managed species in Scott Lake and the population is solely maintained by natural reproduction.

Table 5. Black crappie trap net CPUE, PSD, RSD-P, and mean Wr for Scott Lake, Minnehaha County, 2000-2009.

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
CPUE				42.2		3.2		27.8		6.6
PSD				39		94		22		21
RSD-P				0		31		0		0
Mean Wr				108		106		102		114

Black Bullhead

Management objective: Maintain a black bullhead population with a trap-net CPUE of 100 or less.

Black bullhead CPUE in 2009 was the highest ever sampled in Scott Lake. The sampled fish ranged in length from 120-150 mm (4.7-5.9 in) with a mean length of 136 mm (5.4 in) (Figure 4). It's interesting to note that when the population is maintained at lower densities, some fish over 25 cm (10 in) are produced (Figure 4).

Table 6. Black bullhead trap net CPUE, PSD, RSD-P, and mean Wr for Scott Lake, Minnehaha County, 2000-2009.

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
CPUE				10.2		213.0		200.4		1,738.0
PSD				16		16		3		0
RSD-P				6		0		0		0
Mean Wr				86		92		77		81
Mean Length				204		195		150		136

All Species

Fish populations in Scott Lake appear to fluctuate asynchronously (Table 7) in response to water levels, fishing pressure and various other factors.

Table 7. Gill-net (GN) and trap-net (TN) CPUE for all fish species sampled in Scott Lake, Minnehaha County, 2000-2009.

Species	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
WHS (GN)										
WHS (TN)						0.2				
BLB (GN)				71.0		78.0		44.7		163.7
BLB (TN)				10.2		213.0		200.4		1738
NOP (GN)				0.3						
NOP (TN)								0.2		0.2
GSF (GN)										
GSF (TN)				5.8		0.4		0.6		0.6
OSF (GN)				2.7						
OSF (TN)				81.0				0.2		2.2
BLC (GN)				6.7				0.7		
BLC (TN)				42.2		3.2		27.8		6.6
YEP (GN)				79.3		12.0		2.7		20.0
YEP (TN)				31.6		1.4		4.0		9.0
WAE (GN)				29.0		1.5		23.7		3.7
WAE (TN)				1.0		0.2		10.4		7.8

WHS (White Sucker), BLB (Black Bullhead), NOP (Northern Pike), GSF (Green Sunfish), OSF (Orange-spotted Sunfish), BLC (Black Crappie), YEP (Yellow Perch), WAE (Walleye),

MANAGEMENT RECOMMENDATIONS

1. The overall management goal for Scott Lake is to provide a quality fishing experience close to the Sioux Falls area.

2. Develop an aquatic habitat improvement plan that includes bullhead management, artificial habitat structures and the restoration of natural aquatic habitat.

3. Stock northern pike and/or walleye as needed and available to provide fishing opportunity and to help control the bullhead population.

4. Stock yellow perch as needed to maintain the population at or above the management objective.

5. Conduct lake surveys every other year to monitor the fishery.

Table 8. Stocking record for Scott Lake, Minnehaha County, 1991-2009.

Year	Number	Species	Size
1991	425	Yellow Perch	Adult
1995	800	Yellow Perch	Adult
1997	2,000	Walleye	Fingerling
	133	Walleye	Adult
2000	600	Yellow Perch	Adult
2002	909	Yellow Perch	Adult
2003	10,360	Walleye	Fingerling
2004	259	Northern Pike	Adult
2005	2,200	Yellow Perch	Adult
	4,384	Walleye	Fingerling
2006	1,875	Yellow Perch	Juvenile
	480	Yellow Perch	Adult
2007	331	Walleye	Juvenile
2009	10,800	Walleye	Small Fingerling
	600	Walleye	Large Fingerling

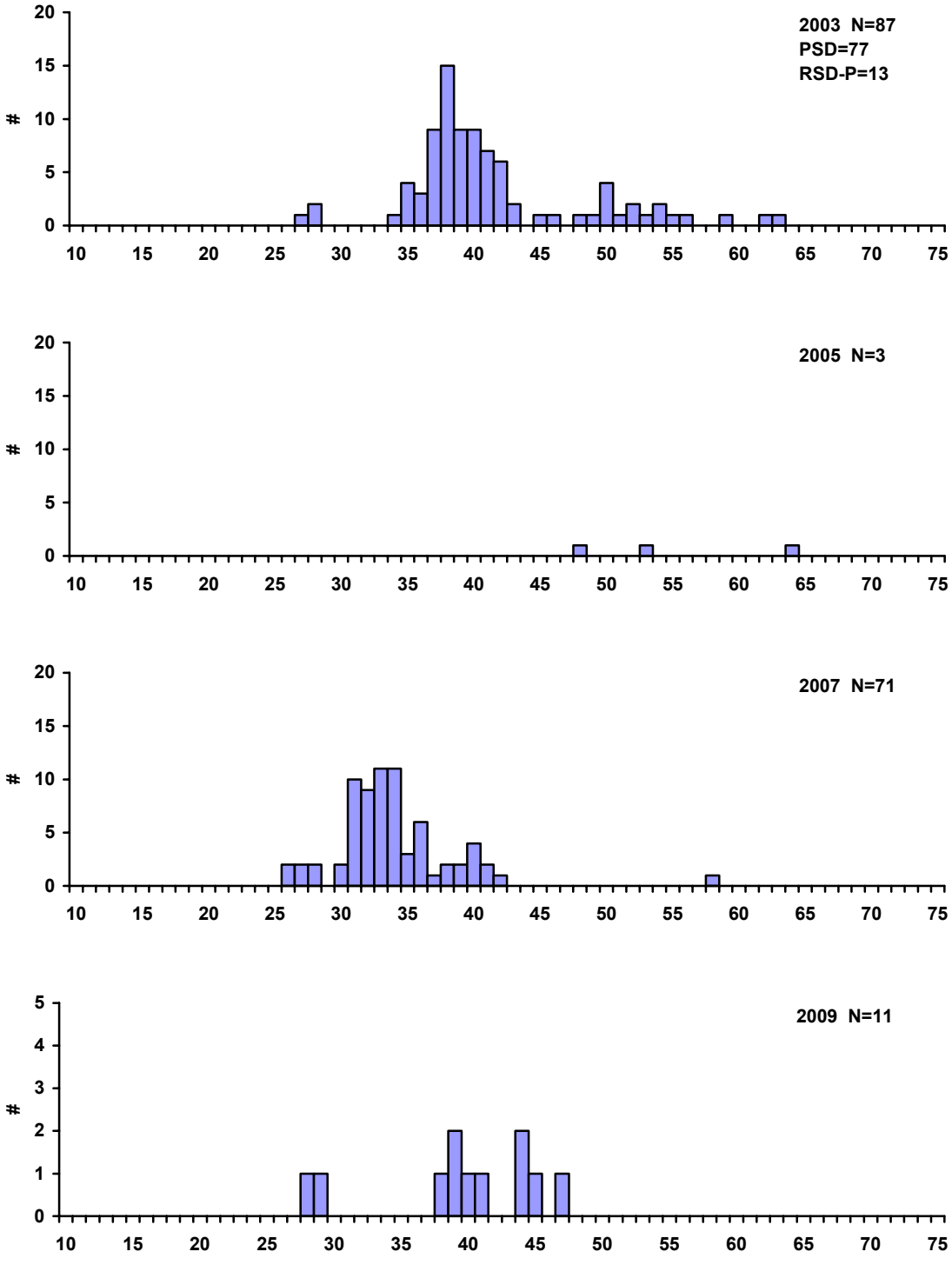


Figure 1. Length frequency histogram for walleye sampled in gill nets from Scott Lake, Minnehaha County, 2003, 2005, 2007 and 2009.

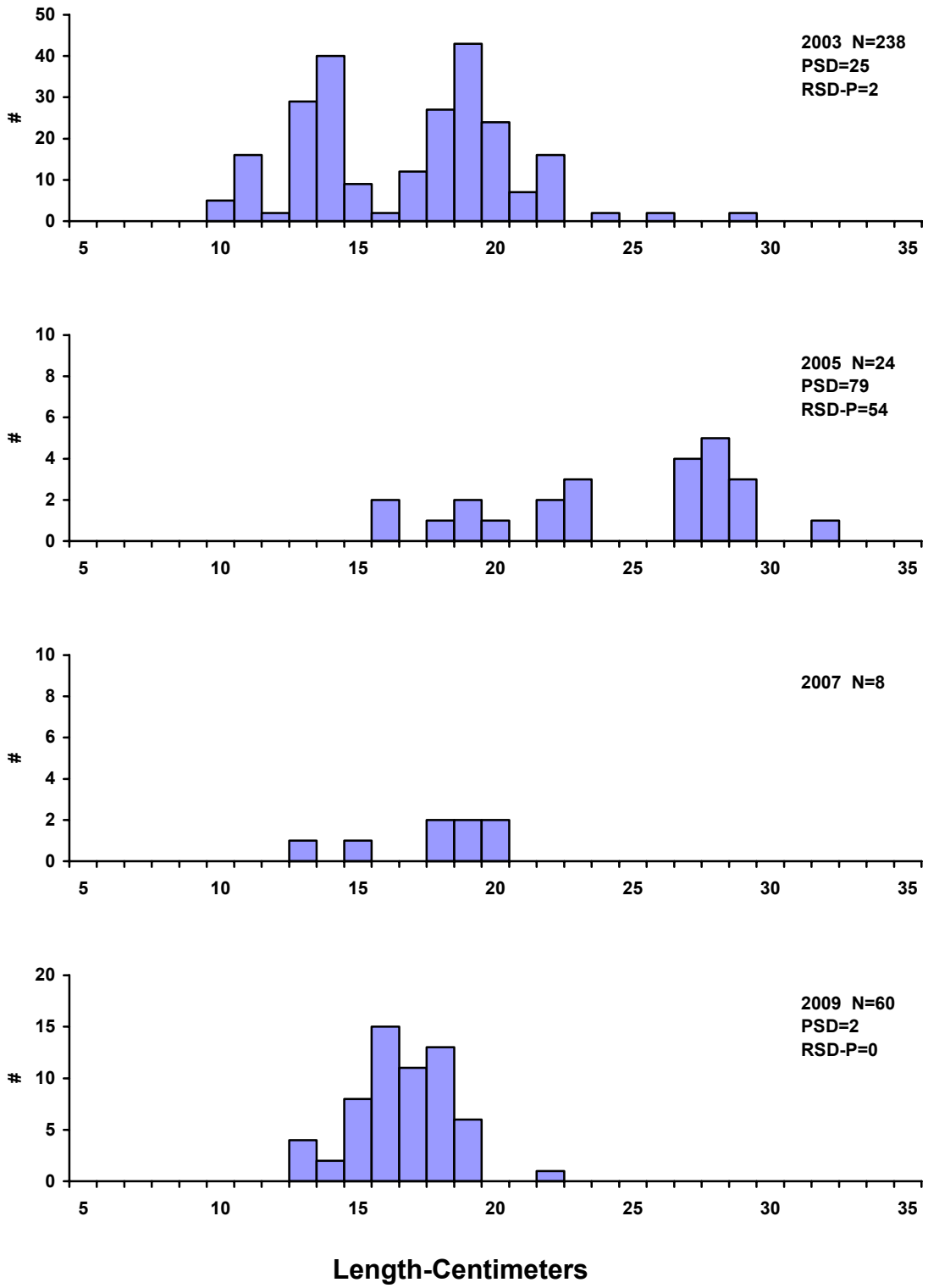


Figure 2. Length frequency histogram for yellow perch sampled in gill nets from Scott Lake, Minnehaha County, 2003, 2005, 2007 and 2009.

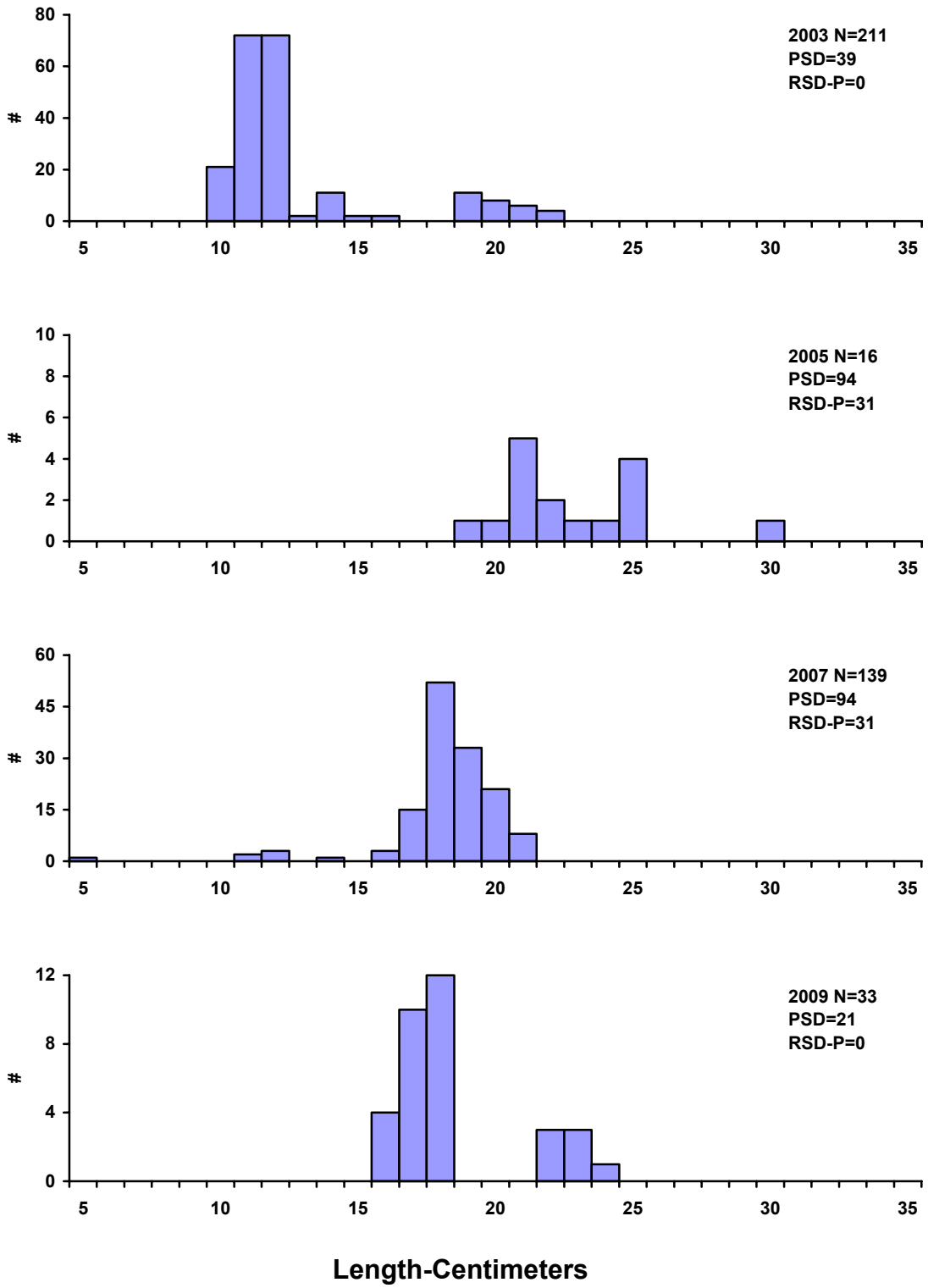


Figure 3. Length frequency histogram for black crappie sampled in trap nets from Scott Lake, Minnehaha County, 2003, 2005, 2007 and 2009.

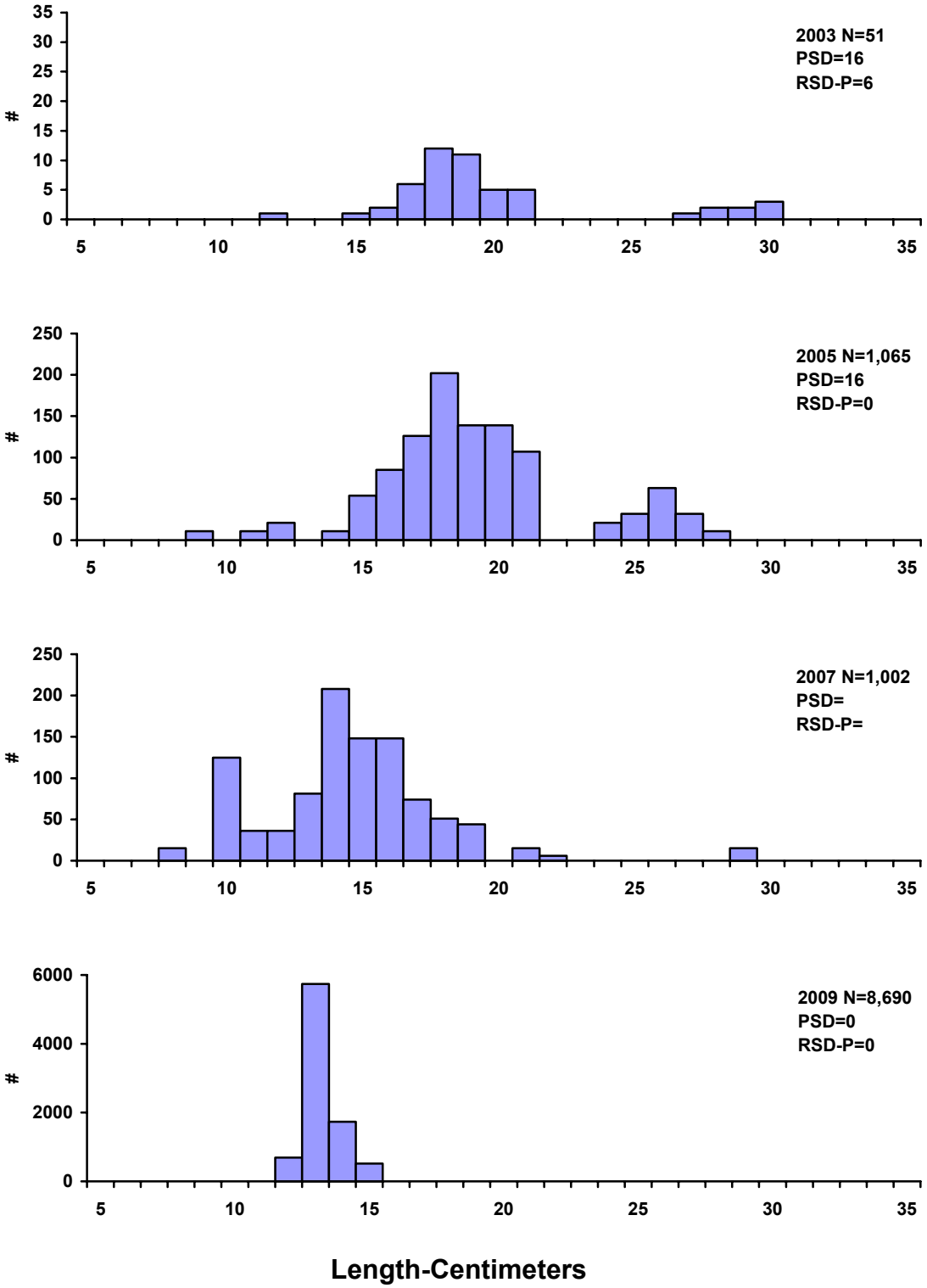
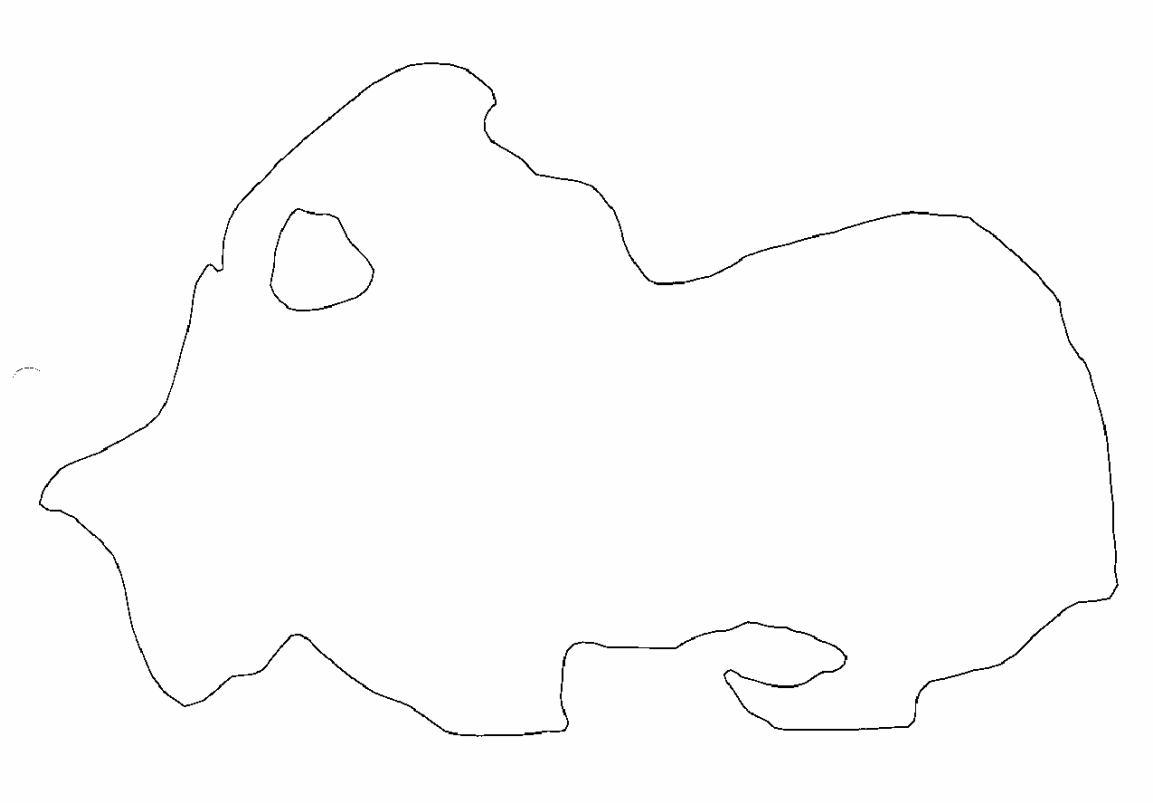


Figure 4. Length frequency histogram for black bullheads sampled in trap nets from Scott Lake, Minnehaha County, 2003, 2005, 2007 and 2009.



Legend
Gill Nets: G
Trap Nets: T

Figure 5. Sampling locations on Scott Lake, Minnehaha County, 2009.

Appendix A. A brief explanation of catch per unit effort (CPUE), proportional stock density (PSD), relative stock density (RSD) and relative weight (Wr).

Catch Per Unit Effort (CPUE) is the catch of animals in numbers or in weight taken by a defined period of effort. Can refer to trap-net nights of effort, gill-net nights of effort, catch per hour of electrofishing, etc.

Proportional Stock Density (PSD) is calculated by the following formula:

$$PSD = \frac{\text{Number of fish} > \text{quality length}}{\text{Number of fish} \geq \text{stock length}} \times 100$$

Relative Stock Density (RSD-P) is calculated by the following formula:

$$RSD\text{-}P = \frac{\text{Number of fish} > \text{preferred length}}{\text{Number of fish} \geq \text{stock length}} \times 100$$

PSD and RSD-P are unitless and usually calculated to the nearest whole digit.

Size categories for selected species found in Region 3 lake surveys, in centimeters.

Species	Stock	Quality	Preferred	Memorable	Trophy
Walleye	25	38	51	63	76
Sauger	20	30	38	51	63
Yellow perch	13	20	25	30	38
Black crappie	13	20	25	30	38
White crappie	13	20	25	30	38
Bluegill	8	15	20	25	30
Largemouth bass	20	30	38	51	63
Smallmouth bass	18	28	35	43	51
Northern pike	35	53	71	86	112
Channel catfish	28	41	61	71	91
Black bullhead	15	23	30	38	46
Common carp	28	41	53	66	84
Bigmouth buffalo	28	41	53	66	84
Smallmouth buffalo	28	41	53	66	84

For most fish, 30-60 or 40-70 are typical objective ranges for “balanced” populations. Values less than the objective range indicate a population dominated by small fish while values greater than the objective range indicate a population comprised mainly of large fish.

Relative weight (Wr) is a condition index that quantifies fish condition (i.e., how much does a fish weigh for its length). A Wr range of 90-100 is a typical objective for most fish species. When mean Wr values are well below 100 for a size group, problems may exist in food and feeding relationships. When mean Wr values are well above 100 for a size group, fish may not be making the best use of available prey.